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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/070,280 | 07/29/2002 | Tajinder Manku | 085909-000000US | 2906 |

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EXAMINER

JACKSON, BLANE J

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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2685

DATE MAILED: 08/26/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/070,280

Applicant(s)

MANKU ET AL

Examiner

Blane J Jackson

Art Unit

2685

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 July 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10,30 and 31 is/are rejected.
- 7) ☒ Claim(s) 11-29 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 July 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>7.8</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-10, 30 and 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ward et al. (U.S. Patent 4,736,390) with a view to Tilley et al. (U.S. Patent 6,225,848).

As to claim 1, Ward teaches a synthesizer for generating signals to be input to successive mixer for demodulating an input signal $x(t)$, the synthesizer comprising:

A first signal generator for producing a first mixing signal S1 which varies irregularly over time and (figures 2 and 4, S1 is the PN modulated local oscillator (32)),

A second signal generator for producing a second mixing signal S2 which varies irregularly over time (S2 is the output of the PN code Generator (33)),

Where $S1 \times S2$ has significant power at the frequency of a local oscillator signal being emulated and neither S1 nor S2 has significant power at the frequency of the local oscillator signal being emulated (figure 2: column 5, lines 12 to column 6, line 10 and figure 4: column 6, lines 45-65).

Ward teaches a synthesizer and demodulating circuit for reducing the DC offset as regards to a zero or direct conversion IF receiver where DC offset is primarily due to RF leakage between the RF and oscillator ports of the mixer causing either the RF or local oscillator signal

to mix with itself (column 4, line 63 to column 5, line 14). Ward is silent as to application of this apparatus for modulating or up-conversion of an input signal $x(t)$.

Tilley teaches a closed loop error correction circuit for correcting DC offset applicable to analog and digital radio receivers and transmitters (figures 1-4, column 6, lines 42-60) where his technique is shown in the context of a radio receiver (column 5, lines 46). Tilley points out that even small quantities of DC offsets can saturate the signal path (column 1, lines 26-51). Since Tilley teaches the need for DC offset correction in the radio receiver and transmitter (column 5, lines 47-51), it would have been obvious to one of ordinary skill in the art at the time of the invention to apply the DC offset reduction technique of Ward to the transmitter as well as the receiver as taught by Tilley to reduce the problems associated with DC offset in both the modulating and demodulating sections of a transceiver.

As to claims 2-4, Ward teaches wherein the signals used to generate the signals $S1$ and $S2$, $S1XS1XS2$ or $S2XS2$ does not have a significant amount of power within the bandwidth of the output signal $x(t)S1S2$ (figures 2 and 3A-3E, narrow band channel filter (38) following the mixer also rejects most of the residual power associated with the offsets, column 5, line 32 to column 6, line 10).

As to claim 5, Ward teaches a synthesizer uses a single time base to generate both mixing signals $S1$ and $S2$ (PN code generator, considered part of the "synthesizer" drives both LO signal paths and considered to have a common, controlled or single time base, figure 2).

As to claims 6 and 7, Ward teaches double balanced mixers with inherent port isolation since port isolation is necessary to reduce DC offsets (column 4, line 63 to column 5, line 4). Given the selected mixers are based on the Gilbert Cell, it is well known in the art that Gilbert cell mixers require the local oscillator input to be a digital or square differential waveform to properly switch the modulating transistors on and off for expected performance.

As to claims 8-10, Ward teaches the mixing signals S1 and S2 are based on a pseudo-random noise generator (figure 2: PN Code Generator (33), column 5, lines 19-23 and column 7, lines 2-11).

As to claim 30, Ward teaches an integrated circuit comprising the synthesizer of claim 1 (column 2, lines 14-25, column 4, lines 43-52).

As to claims 31, Ward teaches the synthesizer of claim 4 where the patterns of the first and second mixing signals S1 and S2 are different from one another (figure 2, column 7, lines 2-11, the PN Code Generator (33)).

Allowable Subject Matter

3. Claims 11-29 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Grandfield (U.S. Patent 5,448,772) discloses a stacked double balanced mixer circuit based on the Gilbert Cell. Pace et al. (U.S. Patent 5,471,665) discloses a differential DC offset compensation circuit for a direct conversion receiver. Sevenhans et al. (U.S. Patent 5,422,889) discloses an offset correction circuit for the I and Q base band signals of a direct conversion receiver. Zamat et al. (U.S. Patent 5,896,421) discloses prior art direct conversion transmitters with noise reduction circuits.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Blane J Jackson whose telephone number is (703) 305-5291. The examiner can normally be reached on Monday through Friday, 8:00 AM-5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Urban can be reached on (703) 305-4385. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Art Unit: 2685

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BJJ

A handwritten signature in black ink, appearing to read 'Nick Corsaro', with a long, sweeping horizontal stroke extending to the right.

**NICK CORSARO
PRIMARY EXAMINER**